

Basic Rules

WAC 296-855-200

Section Contents

YOUR RESPONSIBILITY:

To evaluate employee exposure and protect employees from ethylene oxide

IMPORTANT:

- The requirements in basic rules apply to all employers covered by the scope of this chapter, WAC 296-855-100. Additional sections may apply to you, based on employee exposure monitoring results. Turn to the Scope, WAC 296-855-100, and follow Table 1.

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WAC 296-855-20010

Preventive practices

You must

- Make sure that all containers of EtO whose contents are capable of causing employee exposure above the action level or above the STEL are labeled, tagged, or marked with this warning:

Danger
Contains Ethylene Oxide
Cancer Hazard and Reproductive Hazard

and

- A warning stating that breathing airborne concentrations of EtO is hazardous.
- Keep container labels free of statements that contradict or detract from the labels' hazard warning.



Note:

- EtO is highly flammable and should be kept in a tightly covered container, and in a cool, well-ventilated area away from any type of ignition source.

You must

- Make sure warning labels remain on containers of EtO when these containers are transported.



Exemption:

- Reaction vessels, storage tanks, and pipes or piping systems aren't considered to be containers and do not require labeling.
 - Labeling requirements don't apply when EtO:
 - Is used as a pesticide as defined by the Federal Insecticide, Fungicide, and Rodenticides Act (7 U.S.C. 136 et seq.)
- and**
- Meets the Environmental Protection Agency labeling requirements for pesticides.

WAC 296-855-20020

Exposure control areas

You must

- Establish temporary or permanent exposure control areas where airborne concentrations of ethylene oxide (EtO) exceed or could exceed the permissible exposure limits (PELs) by doing all the following:
 - Clearly identify the boundaries of exposure control areas in any way that minimizes employee access.
 - Post signs at access points to exposure control areas that:
 - Are easy to read (for example, they are kept clean and well lit).
 - and**
 - Include this warning:

Danger
Ethylene Oxide Cancer and Reproductive Hazard
Authorized Personnel Only
Respirators and Protective Clothing may be
Required to be Worn in this Area

- Keep signs and areas near them free of statements that contradict or detract from their message.



Note:

- This requirement doesn't prevent you from posting other signs.

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Exposure Control Areas (Continued)

You must

- Allow only authorized personnel to enter exposure control areas.



Note:

- When identifying the boundaries of exposure control areas you should consider factors such as:
 - The level and duration of airborne exposure.
 - Whether the area is permanent or temporary.
 - The number of employees in adjacent areas.
- You may use permanent or temporary enclosures, caution tape, ropes, painted lines on surfaces, or other materials to visibly distinguish exposure control areas or separate them from the rest of the workplace.

You must

- Make sure employees entering exposure control areas have appropriate respirators available for use.
- Prevent all of the following activities from occurring in exposure control areas:
 - Eating food
 - Drinking beverages
 - Smoking
 - Chewing tobacco or gum
 - Applying cosmetics
 - Storing food, beverages, or cosmetics



WAC 296-855-20040

Personal protective equipment (PPE)

You must

- Make sure employees wear appropriate PPE as protection from skin or eye contact with ethylene oxide (EtO), liquid EtO, or EtO solutions.
- Provide appropriate PPE at no cost to employees.



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Exposure evaluations

IMPORTANT:

- This section applies when there is a potential for airborne exposure to ethylene oxide (EtO) in your workplace.
- When you conduct an exposure evaluation in a workplace where an employee uses a respirator, the protection provided by the respirator isn't considered.
- Following this section will also meet the requirements to identify and evaluate respiratory hazards found in another chapter, Respiratory hazards, chapter 296-841 WAC.

You must

- Conduct an employee exposure evaluation to accurately determine airborne concentrations of EtO by completing Steps 1 through 7 of the exposure evaluation process, each time any of the following apply:
 - No evaluation has been conducted
 - Changes have occurred in any of the following areas that may result in new or increased employee exposures:
 - Production
 - Processes
 - Personnel
 - Exposure controls such as ventilation systems or work practices.
 - You have any reason to suspect new or increased employee exposure may occur.
 - Provide affected employees and their designated representatives an opportunity to observe any exposure monitoring during Step 6 of the exposure evaluation process.
 - Make sure observers entering areas with EtO exposure:
 - Are provided with and use the same protective clothing, respirators, and other personal protective equipment (PPE) that employees working in the area are required to use
- and**
- Follow all safety and health requirements that apply.



WAC 296-855-20050

Exposure Evaluations (Continued)

EXPOSURE EVALUATION PROCESS

- Step 1:** Identify all employees who have potential exposure to airborne ethylene oxide (EtO) in your workplace.
- Step 2:** Identify operations where employee exposures could exceed EtO's 15-minute short-term exposure limit (STEL) of 5 parts per million (ppm).
- Step 3:** Select employees from those working in the operations you identified in Step 2 who will have their STEL exposures measured.
- Step 4:** Select employees from those identified in Step 1 who will have their 8-hour exposures monitored.
- Make sure the exposures of the employees selected represent 8-hour exposures for all employees identified in Step 1 including each job classification, work area, and shift.
 - If you expect all employee exposures to be below the action level (AL), you can choose to limit your selection to those employees reasonably believed to have the highest exposures. If you find these employees' exposure to be above the AL, then you'll need to repeat Step 4 to represent all employees identified in Step 1.



Note:

- You can use Steps 3 through 6 of this process to create a written description of the procedure used for obtaining representative employee exposure monitoring results, which is a requirement in Exposure records, WAC 296-855-20070.

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Exposure Evaluations (Continued)



Exemption:

- You can skip Steps 4 through 7 if you have documentation conclusively demonstrating that employee exposure for a particular material and the operation where it's used, can't exceed the AL or STEL during any conditions reasonably anticipated.
- Such documentation can be based on observations, data, calculations, and previous air monitoring results. Previous air monitoring results:
 - Must meet the accuracy required by Step 5.
 - May be from outside sources, such as industry or labor studies.
 - Must be based on data that represents conditions being evaluated in your workplace.

Step 5: Determine how you will obtain accurate employee exposure monitoring results. Select and use an air monitoring method with a confidence level of 95 percent, that's accurate to:

- ± 25 percent when concentrations are potentially above the AL or 8-hour time-weighted average of 1 part per million (ppm).
- ± 35 percent when concentrations are potentially above the AL of 0.5 ppm or the STEL of 5 ppm.



Note:

- Here are examples of air monitoring methods that meet this accuracy requirement:
 - OSHA Method 30 found by going to: <http://www.osha.gov/dts/sltc/methods/toc.html>.
 - NIOSH Method 3800 found by going to: <http://www.cdc.gov/niosh/homepage.html> and linking to the NIOSH Manual of Analytical Methods.

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Exposure Evaluations (Continued)

Step 6: Obtain employee monitoring results by collecting air samples representing employees identified in Steps 3 and 4.

- Collect STEL samples for employees and operations selected in Step 3.
- Collect samples representing the 8-hour exposure, for at least one shift, for each employee selected in Step 4.
- Make sure samples are collected from each selected employee's breathing zone.



Note:

- You may use any sampling method that meets the accuracy specified in Step 5. Examples of these methods include:
 - Real-time monitors that provide immediate exposure monitoring results.
 - Equipment that collects samples that are sent to a laboratory for analysis.
- The following are examples of methods for collecting samples representative of 8-hour exposures.
 - Collect one or more continuous samples, such as a single 8-hour sample or four 2-hour samples.
 - Take a minimum of 5 brief samples, such as five 15-minute samples, during a work shift at randomly selected times.
- For work shifts longer than 8 hours, monitor the continuous 8-hour portion of the shift expected to have the highest average exposure concentration.

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Exposure Evaluations (Continued)

Step 7: Have the samples you collected analyzed to obtain monitoring results for 8-hour and STEL exposures.

- Determine if employee exposure monitoring results are above or below the following values:
 - 8-hour time-weighted average (TWA_8) of one ppm
 - 15-minute short-term exposure limit (STEL) of 5 ppm
 - 8-hour action level (AL) of 0.5 ppm.



Note:

- You may contact your local WISHA consultant for help:
 - Interpreting data or other information.
 - Determining 8-hour or 15-minute employee exposure monitoring results.



WAC 296-855-20060

Notification

You must

- Provide written notification of exposure monitoring results to employees represented by your exposure evaluation, within 5 business days after monitoring results become known to you.
- In addition, when employee exposure monitoring results are above either the TWA_8 or STEL permissible exposure limit (PEL), provide written notification of all the following within 15 business days after the results become known to you:
 - Corrective actions being taken and a schedule for completion**and**
 - Any reason why exposures can't be lowered to below the PELs.



Note:

- You can either notify employees individually or post the notifications in areas readily accessible to affected employees.
- Posted notification may need specific information that allows affected employees to determine which monitoring results apply to them.
- Notification may be:
 - In any written form, such as hand-written or e-mail.
 - Limited to the required information, such as exposure monitoring results.
 - When notifying employees about corrective actions, your notification may refer them to a separate document that is available and provides the required information.



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Exposure records

You must

- Establish and keep complete and accurate records for all exposure monitoring evaluations conducted under this chapter. Make sure the record includes, at least:
 - The name, unique identifier, and job classification of:
 - The employee sampled
 - and**
 - All other employees represented by the sampled employee.
 - A description of the methods used to obtain exposure monitoring results and evidence of the methods' accuracy.
 - The operation being monitored for employee exposure to EtO.
 - A description of the procedure used to obtain representative employee exposure monitoring results.
 - The date, number, duration, location, and the result of each sample taken.
 - Any environmental conditions that could affect exposure concentration measurements.
 - Any personal protective equipment (PPE) worn by the employee including the type of respirator.



Note:

- You can use Steps 3 through 6 of the exposure evaluation process in Exposure evaluations, WAC 296-855-20050, to create a description of the procedure you used for obtaining representative employee exposure monitoring results.

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WAC 296-855-20070

Exposure Records (Continued)

You must

- Keep exposure monitoring records for at least 30 years.



Reference:

- To see additional requirements for employee exposure records including access, and transfer requirements, go to another chapter, Employee Medical and Exposure Records, Chapter 296-802 WAC.
- Exposure monitoring records need to be kept longer than 30 years for employees participating in medical monitoring, go to Medical Records, WAC 296-849-12080.



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Documentation records

You must

- Keep documentation you develop, of the processing, use, or handling of products made from or containing EtO, that conclusively demonstrates that the action level or STEL for EtO can't be exceeded under any foreseeable conditions of use.
- Include the following in the documentation record:
 - The product that is the subject of the documentation
 - The source of the data
 - Any testing protocol, results of testing, and/or analysis of the product for the release of EtO
 - A description of the operation where the product is used and how the data support your conclusion**and**
 - Other data relevant to the operations, materials, processing, or employee exposures covered by your conclusion.
- Maintain the documentation record for as long as you rely on your conclusion that the action level and STEL can't be exceeded.



WAC 296-855-20090

Training

You must

- Train employees who are potentially exposed above the:
 - Action level (AL) 0.5 parts per million (ppm)

or

 - 15-minute short-term exposure limit (STEL) of 5 ppm.
- Provide training:
 - At the time of initial assignment

and

 - Then at least every 12 months.
- Make sure training and information includes all of the following:
 - The requirements of this chapter
 - The location and availability of this chapter
 - The purpose of medical evaluations and a description of your medical evaluation program required in Medical evaluations, WAC 296-855-30030 in this chapter
 - Monitoring procedures and observations to detect the presence or release of EtO.
 - The physical and health hazards of EtO
 - Actions employees can take to protect themselves from EtO exposure such as work practices, emergency procedures, and PPE
 - The details of your hazard communication program required by another chapter, Employer Chemical Hazard Communication, WAC 296-800-170
 - Operations in employee work areas where EtO is present
 - The following information found in the General Occupational Health Standards, chapter 296-62 WAC:
 - The Substance Safety Data Sheet, WAC 296-62-07383 Appendix A
 - The Substance Technical Guidelines, WAC 296-62-07385 Appendix B
 - Medical Surveillance Guidelines, WAC 296-62-07387 Appendix C.



Notes
